SPHI Seed System Community of Practice

# Summary of Discussion Topic

**Title: Topic 2-Time of seed replenishment in sweetpotato seed systems**

## 1. Summary of participation statistics

Table 1 shows the summary of participation statistics under this topic.

| Duration | Lead discussant; institution & country | No. of contributions | No. of unique respondents (M/F) | No. & type of institutions | No. of countries |
|---|---|---|---|---|---|
| 13 days (24/3/2015-6/4/2015) | Jude Njoku - NRCRI, Nigeria | 13 | 9 (5 male, 4 female) | NARI (1), CIP (8), ARI/Others (2) | 9 |

## 2. Introduction

In this topic, members sought to determine the period of and contributors to yield decline of sweetpotato starter planting material introduced into seed systems. Six questions were posed: (i) how many cycles of planting can a farmer do, from pathogen-tested materials to when severe virus symptoms have appeared? (ii) how sustainable is the use of pathogen-free planting material to replenish stock? (iii) can the breeders focus more on selection of varieties that can recover from virus (reversion) in subsequent plantings, compared with replenishment with high cost pathogen –free planting materials? (iv) what other pathogen, apart from viruses, can affect sweetpotato vine degeneration on the field? (v) what impacts if any, do meteorology and ecological (altitude especially) factors have on sweetpotato production or vine performance? (vi) what impact, if any, do soil-based factors (soil fertility, soil microbial community, soil type) have on vine production and performance on the field? 13 contributions were posted from 11 unique respondents. This summary highlights key areas of consensus, disagreement, insights and learning points that emerged, and any follow-up actions suggested or taken to further learning and develop practice.

## 3. Key points and areas of consensus/disagreement.

No key points of disagreement arose in the discussion. Contributors tend to concur with the points raised, often expounding with examples from other countries and from their country experiences.

*Q1-Number of planting cycles a farmer can do before severe virus symptoms (degeneration):* A key point running through all the contributions is that various parameters are needed to establish the number of planting cycles before degeneration. They include variables such as genetic (the variety), virus pressure - which itself is influenced by factors that vary by context (location/ecology, seasonality), and how the farmer or researcher (before it gets to farmer) manages. Also, inadequate analytical data on degeneration rates, especially using yield loss models, yield/profit gain models based on genetics and/or clean seed, compound the problem. However, one contributor noted (from published research) that it takes 2-3 seasons to maximize degeneration, but did not specify the variety or any other prevailing factors.

Q2 *Sustainability of use of pathogen-free planting material to replenish stock*:

Use of virus cleaned planting material is to be done in US, China (depending on province), Israel, and is happening in the public sector in Africa (e.g. Malawi), where it is enticing for scaling. However, there is skepticism over its feasibility and commercial sustainability for reaching small farmers (who require small quantities) due to logistics and cost of supplying them. Besides logistics and cost, the variety (its resistance and farmer preference) and virus pressure, are key factors that influence sustainability of this system. Examples cited from Uganda, where among the white-fleshed sweetpotato are some highly resistant and farmer preferred varieties, which often beat new clones (esp. OFSP). To put these factors into perspective of the seed systems, one contributor reminded practitioners its objectives: 1) Supplying (better) quality planting material; 2) Disseminating products of breeding programs; 3) Supplying planting material when it is short supply and; 4) Supplying planting material after disaster - and added that it can address one or more of these. The mechanism of supplying (private, NGO, public or hybrid system) also matters. If private system, it is imperative to understand the business model (esp. existence of demand), and that sweetpotato could learn from other clonal crops e.g., Irish potato (in Kenya)[1] and TC banana. Whereas, use of a large- scale public system (e.g. to meet objective 2) needs to be candid about trade-offs and the potential costs involved. Hence, evaluation of potential benefits of pathogen-tested material should be a standard part of seed system efforts to see if it makes sense.

Q3: *Should breeders focus more on selection of varieties (reversion) or replenishment (with pathogen-tested)?*

Most of the contributions lean towards a mix of both reversion and replenishment and that a focus on either would depend on country context e.g. where disease pressure is low and farmers have access to planting material of preferred varieties (Malawi) more focus could be on selection to get new varieties rather than replenishment. Also, a focus on selection to have more resistant varieties could contribute to resilience. Again, demonstrations of benefits and trade-offs should guide decisions on which to focus.

Q4: *What other pathogen, apart from viruses can affect sweetpotato vine degeneration on the field?*

No contributions on this point was made, due to the fact that no study had been done on interactions with other diseases, probably because other diseases are of minor importance as compared to viruses.

Q5: *What impacts, if any, do meteorology and ecological (altitude especially) factors have on sweetpotato production or vine performance?*

Contributors on this issue agree that temperature is very important, because it affects the vector populations and thus at high altitudes generally there is less virus incidence (limited vector activity) though crop takes longer to mature.

Q6*: What impact, if any, do soil-based factors (soil fertility, soil microbial community, soil type) have on vine production and performance on the field?*

Not much research has been done on this aspect, some have noted that the crop responds to input, good soils (sandy loam) with good aeration and lots of microbial activity.

## 4. Status on suggested follow up actions on emerged ideas or techniques (to updated at CoP meeting)

Table 2: status of suggested follow up actions on ideas or techniques

| Suggested idea for action | Follow up action taken | Where (country) & institution | Feedback to CoP |
|---|---|---|---|
| To confirm that popular varieties (e.g. ‘Kenya’ etc.) still do well without replenishment | | | |
| Research degeneration rate, yield loss, yield/profit gain models based on genetics and/or clean seed. | | | |

[1] A farmer selected Irish potato (Shangi- with unknown pedigree), which is preferred primarily because it is early, was presumably rejected by breeders who may have been looking for LB resistance and/or virus. The take-home message: be very careful about assuming what farmer preferred traits really are.